REMARKS

Introduction

In response to the Office Action dated February 8, 2007, Applicants have amended the specification and claims 1 and 8. Claim 2 has been cancelled. Support for amended claim 1 is found, for example, in originally filed claim 2. Support for amended claim 8 is found, for example, on pg. 3, lines 6-7. No new matter is introduced by this amendment. Claims 9-16 are withdrawn. In view of the foregoing amendments and the following remarks, Applicants respectfully submit that all pending claims are in condition for allowance.

Specification

The specification was objected to because of an informality. The Applicant has amended the specification as suggested by the Examiner.

Withdrawal of this objection is respectfully solicited.

Claim Objections

Claim 6 is objected to for referring to lithium titanate as a changeable electrode active material and spinel lithium maganate as an unchangeable electrode. As described in Examples 1 and 2 of the present application, the positive electrode active material layer 2 contains spinel lithium manganate $LiMn_2O_4$ and the negative electrode active material layer 3 contains lithium titanate $Li_4Ti_5O_{12}$ (pg. 13, line 31 – pg. 14, line 26). The lithium titanate is the unchangeable electrode active material in Example 1 and the changeable electrode active material in Example 2 (*see, e.g.*, pg. 16, lines 27-29).

The present application states on pg. 14, lines 13-22:

> In other words, the changeable electrode active material is an active material having a characteristic in which, once a charging rate of the changeable electrode active material reaches about 100% during charge, a change in the voltage of the changeable electrode active material becomes **greater** than that before the charging rate thereof reaches about 100%, and the unchangeable electrode active material is an active material having a characteristic in which, even when the charging rate of the changeable electrode active material reaches about 100% during charge, a voltage of the unchangeable electrode active material is **almost the same** as that before the charging rate of the changeable electrode active material reaches about 100% (*emphasis added*).

Further, the present application states on pg. 14, line 27 – pg. 15, line 5:

> In Example 1, as shown in FIG. 7, the positive and negative electrode active material layers 2 and 3 are adjusted such that the charging capacity of the negative electrode active material layer 3 as the unchangeable electrode active material becomes 120% of that of the positive electrode active material layer 2 as the changeable electrode active material. Here, the charging capacity of the positive electrode active material layer 2 or the negative electrode active material layer 3 is uniquely decided depending on the content of the spinel lithium manganate or the lithium titanate. Therefore, by adjusting the contents of these materials, the charging capacity of the negative electrode active material layer 3 can be set to 120% of that of the positive electrode active material layer 2.

If the content of lithium manganate is more than that of lithium titanate, spinel lithium manganate becomes the unchangeable electrode active material (*see, e.g.*, Example 2). Conversely, if the content of lithium titanate is more than that of spinel lithium manganate, lithium titanate becomes the unchangeable electrode active material (*see, e.g.* Example 1). Thus, the charging capacity of the positive electrode active material layer and the negative electrode active material layer depends on the content of the lithium titanate and spinel lithium manganate.

Claim 8 was objected to for an informality. The Applicant has amended claim 8 as suggested by the Examiner.

Withdrawal of this objection is respectfully solicited.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-4 and 6-8 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,766,796 (hereinafter Abraham).

Amended claim 1 recites, "...a charging capacity of any one of the positive electrode active material layer and the negative electrode active material layer made of the unchangeable electrode active material is 110% or more relative to the charging capacity of the other made of the changeable electrode active material."

In the present application, when the contents of the changeable electrode active material (spinel lithium manganate) and the unchangeable electrode active material (lithium titanate or graphite) are adjusted, the charging capacity of the negative electrode active material layer 3 is set to 110% or more of that of the positive electrode active material layer 2 (*see, e.g.*, Examples 1 and 3). When the contents of the changeable electrode active material (lithium titanate) and the unchangeable electrode active material (spinel lithium manganate) are adjusted, the charging capacity of the positive electrode active material layer 2 is set to 110% or more of that of the negative electrode active material layer 3 (*see, e.g., Example 2*).

Abraham describes capacities of the electrode active material, $Li_4Ti_5O_{12}$ and $LiMn_2O_4$ per unit weight (mAh/g) (*see,* Tables 1-3). The charging capacity (mAh) of the present application is *different* from the capacity per unit weight (mAh/g) of Abraham. Abraham teaches that the $Li_4Ti_5O_{12}$ //PAN electrolyte// $LiMn_2O_4$ cell was fabricated by sandwiching a 50μm thick PAN polymer electrolyte with a 28μm thick $Li_4Ti_5O_{12}$ electrode and a 46μm thick $LiMn_2O_4$ electrode with capacities of 5.9 mAh and 6.7 mAh, respectively (*see,* Example 5; col. 7, lines 29-33). In Tables 1 and 2, Abraham measures the discharge capacities (mAh/g) of $Li_4Ti_5O_{12}$ and $LiMn_2O_4$ at specific current densities (0.2, 0.5, 1.0, 2.0, 5.0 mA/cm^2).

The present invention requires that the charging capacity (mAh) of the electrode active material layer made of the unchangeable electrode active material is 110% or more relative to the charging capacity of the electrode active material layer made of the changeable electrode active material, is different from **the charging capacity per unit weight (mAh/g)** described in Abraham. The claimed "...charging capacity (mAh) of any one of the positive electrode active material layer and the negative electrode active material layer made of the unchangeable electrode active material is 110% or more relative to the charging capacity (mAh) of the other made of the changeable electrode active material," recited in amended claim 1 is *not the same* as "the charging capacity per unit weight (mAh/g) of the unchangeable active material electrode active material is 110% or more relative to the charging per unit weight (mAh/g) of the changeable electrode active material."

The Examiner has not provided a factual basis to support the allegations that the material of Abraham would inherently have the characteristics of the changeable electrode active material or an unchangeable electrode active material required by claim 1. As anticipation under 35 U.S.C. § 102 requires that each and every element of the claim be disclosed, either expressly or inherently (noting that "inherency may not be established by probabilities or possibilities," *Scaltech Inc. v. Retec/Tetra*, 178 F.3d 1378 (Fed. Cir. 1999)), in a single prior art reference, *Akzo N.V. v. U.S. Int'l Trade Commission*, 808 F.2d 1471 (Fed. Cir. 1986), based on the forgoing, it is submitted that Abraham does not anticipate claim 1 nor any claim dependent thereon.

Claim Rejection Under 35 U.S.C. § 103

Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Abraham in view of U.S. Patent No. 6,410,188 (hereinafter Shirane). The Office Action acknowledged that

Abraham fails to teach a battery having a graphite anode. The Office Action relies on Shirane to attempt to cure the deficiencies of Abraham.

The Office Action asserts that Shirane teaches that the completion voltage for the batteries is approximately 4.2 V.

Shirane fails to cure the deficiencies of Abraham. Neither Abraham nor Shirane, individually or combined, teach or suggest, "...a charging capacity of any one of the positive electrode active material layer and the negative electrode active material layer made of the unchangeable electrode active material is 110% or more relative to the charging capacity of the other made of the changeable electrode active material," as required by amended claim 1.

Claim 5 depends from claim 1 and includes all of the features of that claim plus additional features, which are not taught or suggested by the cited references. Therefore, for at least these reasons, it is respectfully submitted that claim 5 also patentably distinguishes over the cited references.

Conclusion

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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